Integrated Water Quality and Aquatic Communities Protocol – Wadeable Streams

Appendix J: Manufacturer's Manual to Klamath Network Water Quality Multi-probe

Draft Version 1.0

Revision History Log:

Previous Version	Revision Date	Author	Changes Made	Reason for Change	New Version

This appendix contains the full manual for the Amphibian (computer module) and Manta (water quality multi-probe). This manual is included to supplement the appropriate SOPs on their use.

Amphibian

User's Guide

Version Information

March 16, 2004 – First Version
May 20, 2004 – Changed wording page 45.
June 21, 2004 – Changed screen shots P.30 – 36.
June 28, 2004 – Added Circulator on/off and Clean Optics commands.
July 15, 2004 – Revisions on FAQs
August 30, 2004 – Added site location details
October 25, 2004 – Updated CFSetup
November 17, 2004 – Updated with new charger and install procedures.
February 15, 2005 – Added HP iPAQ 2110 installation screens
February 24, 2005 – Updated ActiveSync only installation
March 10, 2005 – Revised layout
July 1, 2005 – Updated CFSetup
August 24, 2005 – Changed address info
January 12, 2006 – Updated Manta logging setup; updated barometric pressure
June 9, 2006 – Added annotation

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Table of Contents

C H A P T E R 1: Installation

System Requirements

You need a USB port on your PC.
Windows XP (Home or Professional), Windows 2000, Windows ME, or Windows 98

Note – Windows NT Workstation is not compatible with the USB connectivity.

Getting Started

Load ActiveSync onto your PC
Connect your Amphibian to the PC
Load Eureka Amphibian Software onto your PC
Connect your Multiprobe and View Data

**NOTE: DO NOT ATTEMPT TO CONNECT YOUR POCKET PC TO YOUR DESKTOP PC
UNTIL YOU HAVE INSTALLED ACTIVESYNC.**

Insert the "Eureka Install Me First" disc into your computer's cd-rom drive, and the installation
menu screen will open:

Install Disc

Follow the step in order to install all the necessary
software.

Step #1 – Install ActiveSync. The following screen will appear. Follow the instructions on the screen that guides you through the installation. Do not remove the cd until all files have been installed.
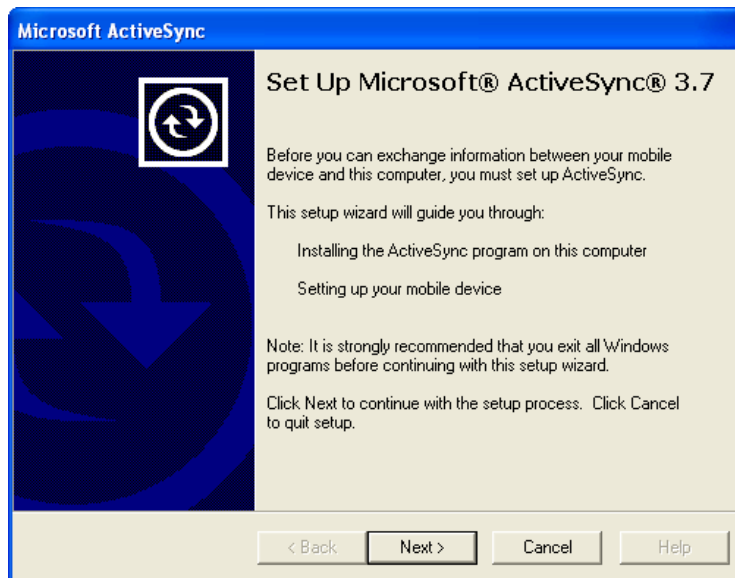
When the installation is complete, you will see the following screen. Connect your Amphibian to your PC using the beige USB cable supplied with your Amphibian. The black connector connects to the bottom of the Amphibian case, the other end to a USB port. There is no need to remove the Pocket PC from the Amphibian case. Click "**Next.**"
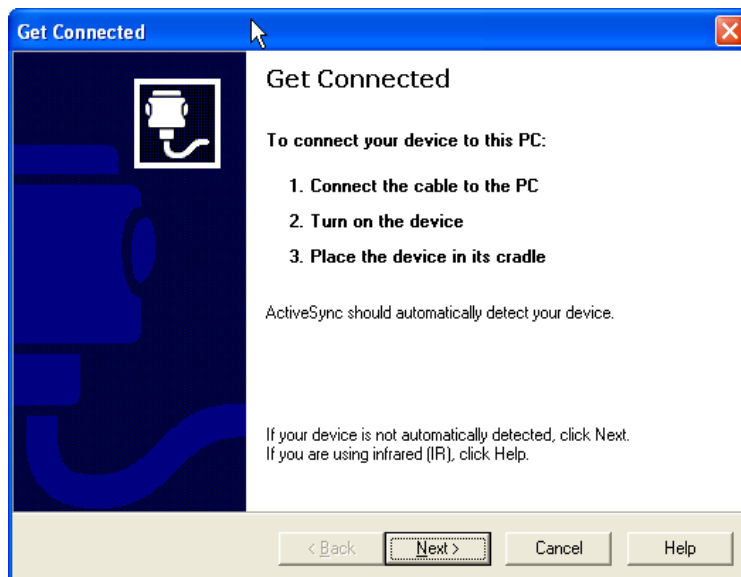
Installation is now complete. Leave your Amphibian connected and click "**Next**."
We recommend you set up a Guest partnership.

Tip!!!

Standard Partnership = You are the only one using this computer

Guest Partnership = This is a shared computer and you may not want contact info synchronized

Use the Standard Partnership if this is your only Pocket PC device and the unit is not being used for field testing purposes. Setting up a standard partnership allows you to store personal data on your Pocket PC such as contacts, appointments, and other information. This information can then be transferred to other desktop PCs. Please refer to the Pocket PC manual for more information.

You are connected and synchronized!
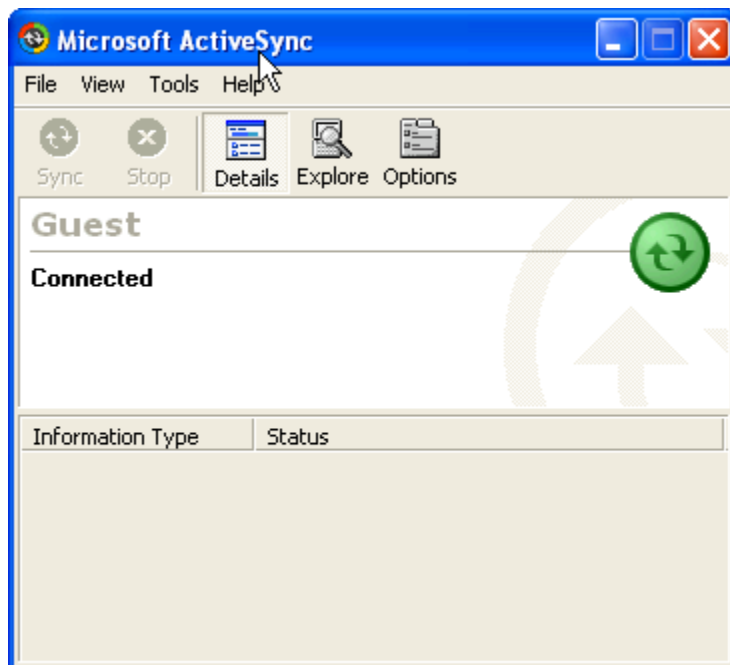
You will see the Green sync icon ⟳ on your desktop in the lower right corner. It will be grey when not connected to your Amphibian.

Step 2 - Install the Eureka software onto your PC. This software allows you to transfer data from the Amphibian to your PC. Insert the Eureka cd into your cd-rom drive and double-click on eureka.exe if it does not run automatically.
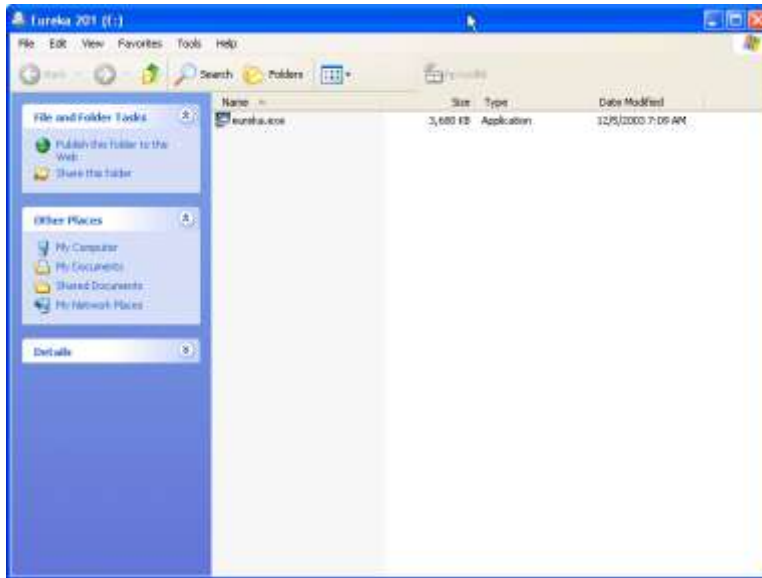
Follow the instructions on the screen:
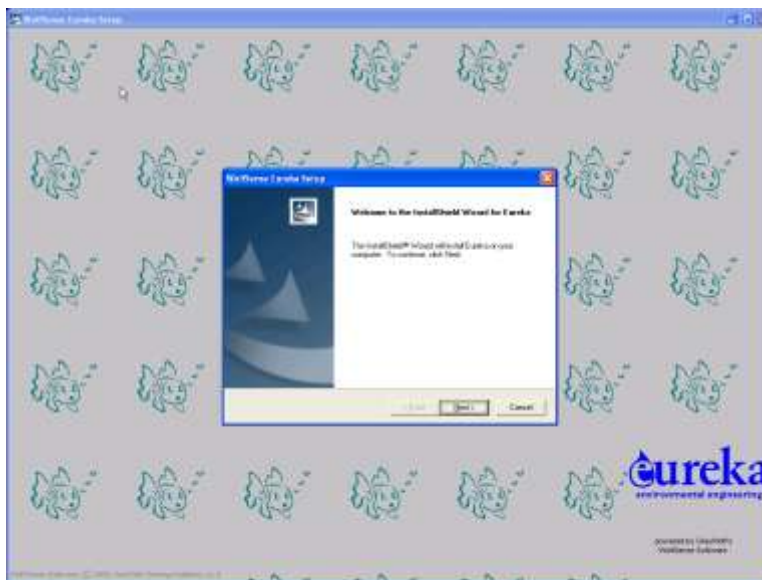
Choose the default directories or your own customized directories to install the software.

Select the installation options. If you purchased a Pocket PC with your Amphibian, Eureka software has already been loaded onto the Pocket PC. Choose the top option only.
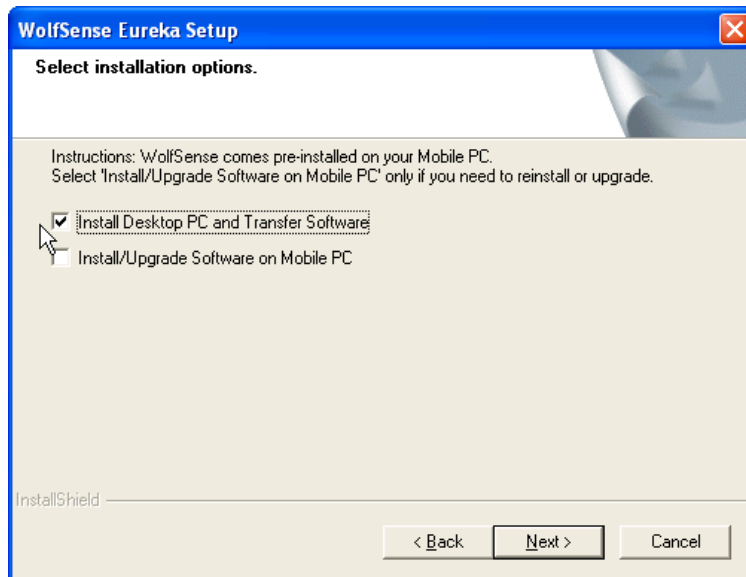
When installation is finished, a Eureka icon will be placed on your desktop.
Double-click on this to open the Eureka's PC software. Please see Chapter Six for more information on the Amphibian PC software.
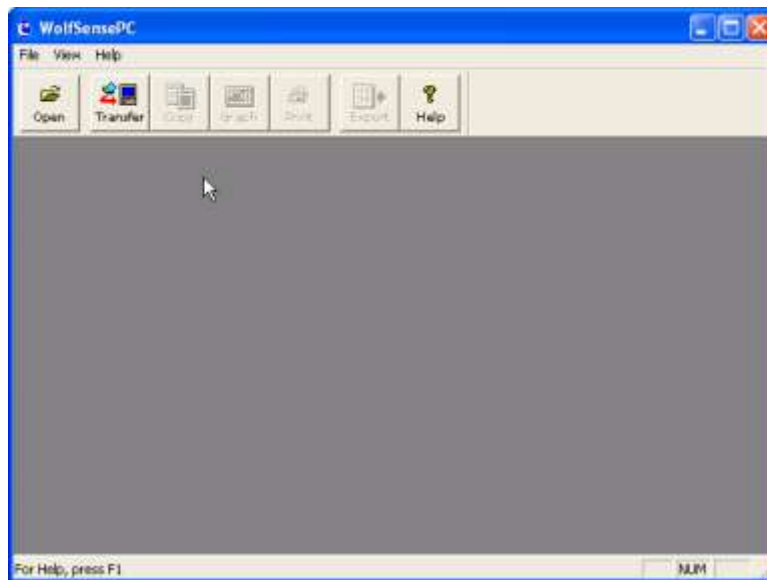
C H A P T E R 2: Components

Amphibian Hardware

Amphibian Quick Charge Unit   USB Cable   Hand Strap

The Quick Charge Unit plugs into the bottom of the Amphibian case. It takes three to four hours to fully charge the Amphibian's battery pack. When charging, the orange battery light will stay on constantly. When it is nearly charged, it will drop down to Top-off charge. It is in trickle charge mode when it is green. It is fully charged and can be unplugged.

Note: After 12 hours, the battery will stop charging, even if plugged in. You must unplug for 30 seconds to begin the cycle again.

Attach the Amphibian's hand strap with the locking screws and Allen wrench provided.

Connectors

Top connector: Marine grade connector. Attach the Multiprobe and secure firmly. Replace dust cap when not in use.

Bottom connector: USB and Power Charger

Hydrolab Adapter Cable - A six foot serial cable has been supplied with your Amphibian for connecting to Hydrolab Series 4a instruments manufactured after October, 2002.

SD / MMC Card

SD (Secure Digital) memory cards and Multimedia Cards (MMC) are the latest generation memory devices that offer an incredible combination of high storage capacity, fast data transfer rates, great flexibility and excellent security in a memory card about the size of a postage stamp! Based on nonvolatile memory components and encased in a protective molding they do not require power to retain the information stored on them. Since they are based on solid-state components they have no moving parts to skip or break down making them highly reliable.

If you purchased your Amphibian with an SD card, it has been installed. The Eureka Amphibian program has been installed on the card, and by default your data will be stored on this card as well.

Using the Amphibian

Make sure the Velcro straps inside the Amphibian case are securely fastened, protecting your Pocket PC. Make sure your batteries are fully charged. Securely fasten the locking clips on the Amphibian case. The lower latches must catch first, then the top latches will snap into place.

Batteries and Regulator Board

The Amphibian's 10 sub-C batteries provide 12 volts. The nickel-metal hydride batteries under normal conditions are expected to last for over 1000 charge and discharge cycles.

The Amphibian battery pack provides power to your multiprobe and the Pocket PC. Eureka has installed a regulator board to monitor the energy discharge. When the voltage drops below a certain point, you will not be able to power your multiprobe and it will say no probe attached. Under normal conditions there will be enough power remaining to run the Pocket PC for several hours. When there is not enough power in the battery pack, the Pocket PC will then run on its own battery pack.

Cleaning and Maintenance

Do not use acetone (or any ketone) or alcohol to clean the Amphibian. Clean your Amphibian case with a little soap and water. The vinyl membrane can be replaced and is not covered under warranty. The membrane and plastic guard can be cleaned with a window cleaner.

Do not open your Amphibian case and allow water to enter. If you must clean the inside, remove the Pocket PC and the batteries. Do not allow water to come into contact with the regulator board.

C H A P T E R 3: Amphibian Basics

Pocket PC Operation

Turning on the Amphibian

The Amphibian can be turned on by pressing any of the
four smaller buttons on the front of the Pocket PC. The
buttons have been preprogrammed for your convenience
to launch specific programs.

Button 1: Notes
Button 2: Contacts
Button 3: Calendar
Button 4: Eureka

Turning off the Amphibian

The Amphibian will turn off automatically after a set period
of time. By default, we have set the Amphibian to turn off
after 5 minutes on both internal and AC power.

Note: When the Amphibian 8-cell battery pack is charged,
the Amphibian thinks it is running on AC power. One
good way to determine if your battery needs charging is to
check the power settings to see how much power
remains. If the Amphibian is running on the Pocket PC
battery, it will show "**internal battery power remaining**."

Press button #4 to launch Eureka

Note: If the Eureka Amphibian software is running in the background, the unit will not turn off
draining battery power. Check for running programs by tapping on **settings, system, memory,
running programs.**

Starting Eureka Software

Press button four (on the far right) and this will launch the
Eureka software.

Tap on "**Start**", tap on "**Eureka**" to launch the software➔

Exiting Eureka Software

Choose "**Exit"** from the File Menu.

Note: Clicking on the X in the top right does not exit the program. It is a nuance of Pocket PC software, and actually keeps the program running in the background. This will prevent the Amphibian from turning off and will consume battery power.
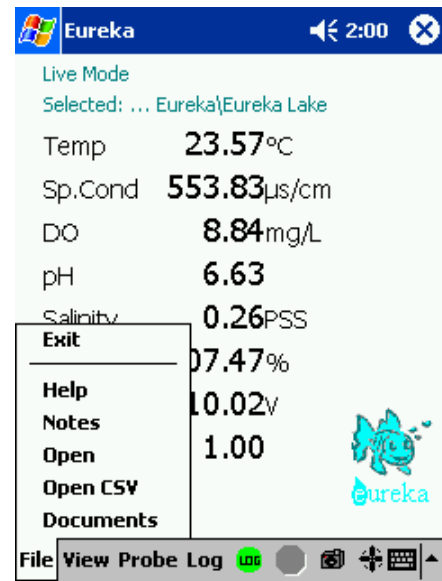
Choose Exit from the file menu to end the program.

Connecting to Your Multiprobe

Plug your instrument into the nine pin connection on the top. From the probe menu, choose the brand of instrument you are connecting to.

NOTE – YSI users must disable Auto Sleep RS232 in the instrument setup menu. See the Appendix for detailed instructions.

Hydrolab Users – use the supplied six foot serial cable if your instrument was manufactured after October, 2002.

C H A P T E R 4: Amphibian Software Screens

File Menu Options:

Exit – Ends the Program

Help – Launches the help application

Notes – Allows you to add a note such as text, drawings, audio, or templates to your data file

Open – Opens a file that has been created on the Amphibian

Open CSV – Opens a file that has been downloaded from a multiprobe

Documents – Opens any document on your Pocket PC with the appropriate program, such as PDF files and Pocket Word files
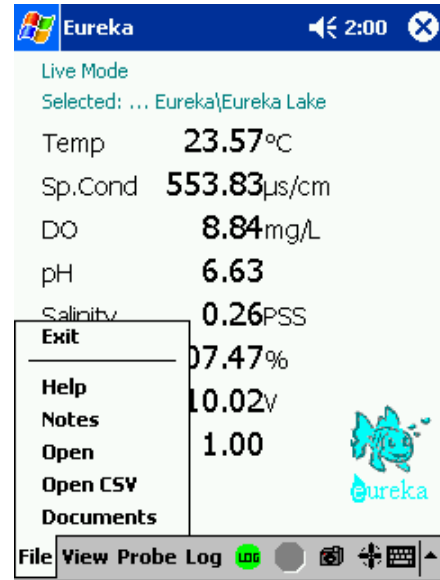
View Menu

The View Menu allows you to choose the parameters displayed on the screen. Note – you cannot change the units with the Amphibian. The Amphibian only displays the units that have been set up on your instrument. Also, if you used HyperTerminal or another program and set-up your instrument to not display certain parameters, you will have to manually turn those back on.

Statistics – The Statistics dialog will display minimum and maximum readings and averages for a selected measurement parameter. Choose the measurement you wish to display by tapping the down arrow on the drop-down list on the right and then tap a measurement parameter. Any existing statistics for that parameter will be displayed.

Statistics info may be gathered in two ways: Automatic and Manual. In Automatic mode, readings are updated every two seconds. The three buttons will display CLEAR, STOP and MANUAL. CLEAR will reset the min, max, average info, STOP will pause the collection of statistics info. (The STOP button will then change to RESUME which may be tapped to resume collection.)

The MANUAL button will clear any statistics info and switch to Manual collection mode.
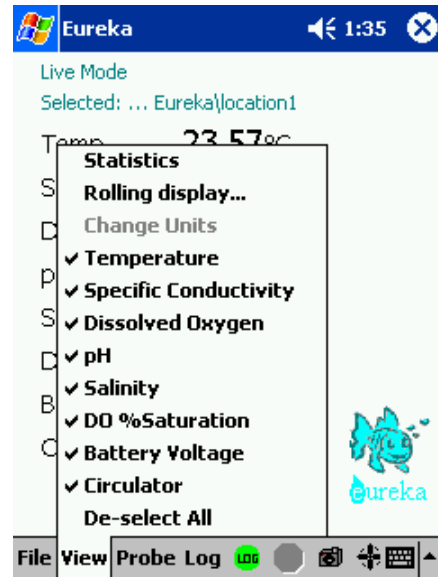
In Manual mode, readings must be added by tapping the ADD button. The number of readings sampled will be displayed. The CLEAR button will reset any statistics info and the AUTO button will switch to automatic mode.

Change Units – This functionality is not available at this time.

Rolling Display – Shows the most recent reading to the far left, with the previous four readings following. The readings are updated every second.

De-select All – Shows no parameters.

Probe Menu

Information – This option returns information from the multiprobe

Calibration – This option allows you to calibrate your instrument

Hydrolab – You must tell the Amphibian which brand of multiprobe you are connected to. A check mark indicates that you are connected to a Hydrolab® Series 4 or 4a multiprobe.

YSI – You must tell the Amphibian which brand of multiprobe you are connected to. A check mark indicates that you are connected to a YSI® 600 or 6000Series multiprobe.

NOTE – YSI users must disable Auto Sleep RS232 in the instrument setup menu. See the Appendix for detailed instructions.

Circulator – For Eureka Manta and Hydrolab multiprobes, you can turn the circulator on and off.

Clean Optics – For Eureka Manta and YSI multiprobes, this will send a command to clean the optical sensors – Turbidity and Chlorophyll (if installed).

The icon in the lower left indicates that no probe is attached. Choose Manta, Hydrolab or YSI to connect to an instrument.

Get Baro Pressure – (Manta Only) If your Manta has a depth sensor rated to 50 meters or less, you can use the depth sensor to get a barometric pressure reading in order to calibrate dissolved oxygen. Make sure your Manta is exposed to the air, and there is no water in contact with the depth sensor.

Set Baro Pressure – (Manta Only) This will automatically set the barometric pressure in the Manta.
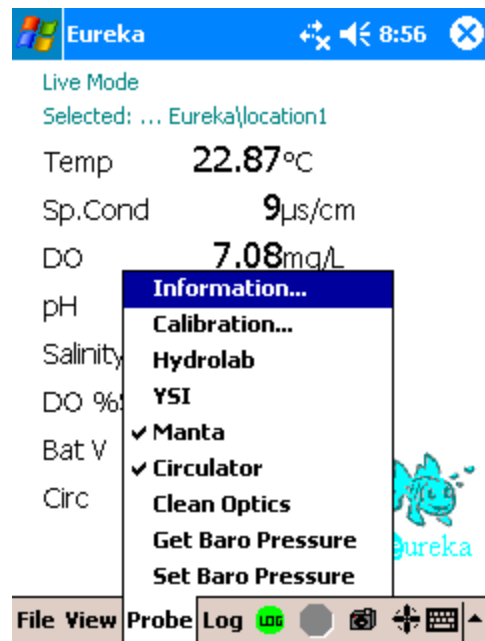
Log Menu

Snapshot Log – Takes the current readings and stores them in the active file. If the file is empty, it stores the reading in the first line. If the file is not empty, you will be given the choice to append or overwrite. See "Locations" below to name the file.

Standard Timed Log – Allows you to set the interval for a timed log. The timed log will store a reading to the file you have selected at the specified interval.

Locations – Allows you to name or specify the file to use

Log Options – Allows you to set /select the averaging function. With this enabled, readings will be logged as the average value monitored over the averaging period.

Start Log – Starts logging with the specified parameters

Stop Log – Stops logging

Download Sonde File – When connected to a logging multiprobe, this option will look at the available files for download. Click the file you wish to download and tap "Select."

Setup unattended log – When connected to a logging multiprobe, this will allow you to set up the logging start time, end time, and logging interval.

Delete files – This allows you to delete files on logging multiprobes
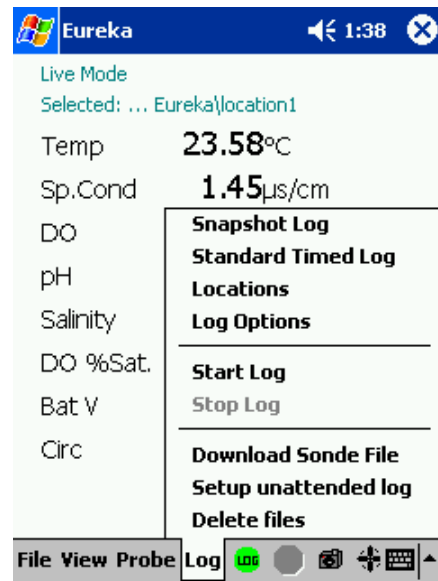
The Main Display

The main Eureka display screen will display current readings from the probe. The text Live Mode or Logging to will be displayed to indicate the current action. The text Selected... indicates which location file is currently selected for logging.
Tap the stylus on a measurement parameter to select it. Use the View All (View Menu) to select all the measurement parameters for display.

Rolling Display
During a log, the display will automatically change to Rolling Display Mode. The current readings are displayed in a slightly larger font towards the left side of the display. The last logged readings saved to file are displayed smaller to the right of the current readings and are 'rolled off' to the right. Additionally the time stamp for the last saved reading is displayed below the readings.
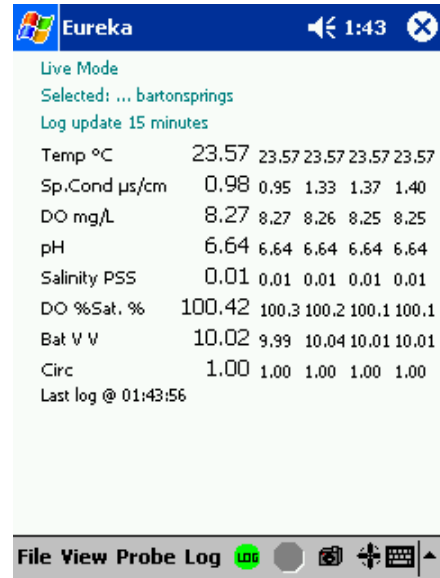
Viewing data with the rolling display setting enabled

Stabilization
When a multiprobe is first powered on, the readings need time to stabilize. During this warm-up period, the readings will be grayed-out until they stabilize and the ▆▆icon will be displayed. Logging and averaging are suspended until the probe is stabilized.
Icons
Command Icons: (shortcuts for menu items)
Start Log
Stop Log
SnapShot Log
Circulator On/Off (Grayed out when YSI probe selected)

Status Icons:
No probe attached
Probe warming up
Logger is running
Statistics is running
The Pocket PC batteries are critical

Notes Icons: (notes associated with current location)
Calibration Settings
Text Note
Audio Note
Drawing Note
Report Template

Logging Data – Profiling Applications

Location Dialog Box

The Location dialog box shows a list of all Locations that exist on the Pocket PC. Select a location by single-tapping the location name. The selected location will be highlighted and the full name of the location will be displayed at the bottom of the screen.
Memory: Above the location list, at the top of the dialog, is the Memory drop-down list.
During install the memory is initially set to non-volatile memory when available (\My Flash Disk\eureka \ or a similar name) or to internal RAM (\my documents\eureka\).
All installed memory devices will be available for selection in the memory list (this includes internal and external Flash memory and internal RAM memory. *** For maximum data security, we recommend that you log to non-volatile Flash Memory (listed as Internal Flash, Storage Card, or Safe Store). To change the currently selected Memory, click the down arrow at the right side of the Memory list.

Tap in file name and tap "**New**".
It shows the file is empty.

Creating a new Location

To create a new empty location file for storing logger data, type a new name in the edit box to the right of the "**New**" button. To enter a name, tap once in the edit field to place the cursor in the box and then tap the keyboard or handwriting recognition icon in the bottom right corner of the screen. You may also tap the left and right arrows above the "**New**" Location name field to step through numbered location names. (This is useful for users without access to a keyboard on their mobile device.) After a name has been entered, tap the "**New**" button. The new location name will automatically be selected.

Creating Sites

Sites are subfolders. If you are collecting data at numerous points, you may wish to set up your files as subfolders. To do this, put a backslash after the location name. Example:

Lake Burns\Power Plant
Lake Burns\Beach
Lake Smith\Power Plant
Lake Smith\Beach

Do not put any spaces before or after the backslash.
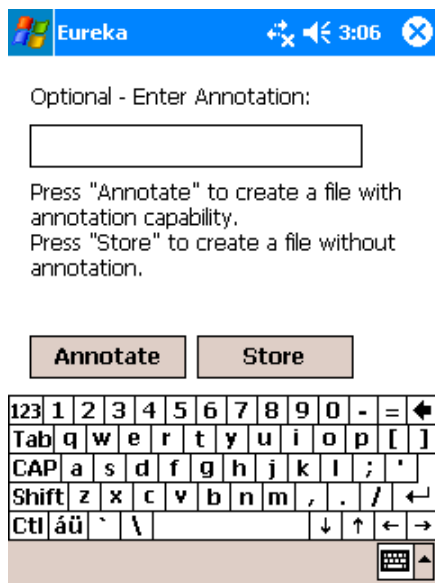
When you transfer the data back to your PC, Eureka's program will automatically create the necessary subfolders on your desktop. In the example above, there will be two folders Lake Burns and Lake Smith, and each will have two files, Power Plant and Beach.

To store readings, click on the green log icon at the bottom or choose snapshot log from the log menu.

Annotation

You can annotate each record in a file with up to a 40 character note. The first time you store a reading to the file location, you will be asked if you want to have an annotated file. You don't have to have an annotation for the first record, but you have to tell the Amphibian that you are going to annotate. When you transfer the data to your PC, a column with the annotations is added at the end of the records.

If you choose annotation, every time you log a reading to the file you will be given the opportunity to enter an annotation. If you choose to skip annotation, you will not be asked to enter an annotation on subsequent logs.
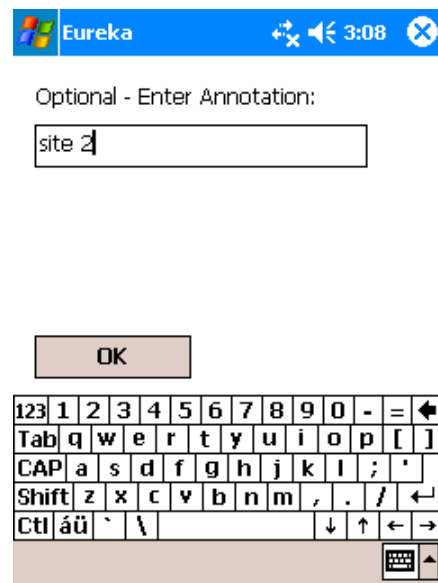
Click "Store" to skip annotation

You can choose not to annotate
An individual record. Simply enter
nothing into the annotation box.

Optional Bar Code Scanning

If you insert a bar code scanner into your Amphibian, you can scan in the bar codes into the annotation field. Set up your bar code scanner to insert a comma after each reading and it will be converted to a new column.

Setting up a Logging Run

Select the multiprobe you are working with, Eureka, Hydrolab or YSI

From the Log menu, tap "**Setup unattended log**."

Enter the filename, starting and stop dates. Click on the keyboard icon to make it easier to enter times.

Note: Pocket PC software treats each time segment as an individual field. You can only click on the hour, minute, or second! If you need to change more than one time segment, change one time segment, then click on a different field, then go back and change the second time segment.

Note: For Eureka Manta log setup, the menu system is simplified. There is no need to set the start and stop time and date. When you turn the logging switch to on, it will start logging at the preset interval.

Setup example for Hydrolab

Example: To change the interval from one hour to 30 minutes, first change the minutes to 30. Then click anywhere in another field, such as stop date. Don't change anything, and then click on the hour of interval and change that to zero.

After all the information has been entered, tap "**Start**" When completed, you will get a message that it was successful.

Manta Example

Setting up a logging run with the Manta is essentially the same.

Step 1 – Confirm that you are not already running a log:

The image on the left says **Stop**. Therefore a logging run is active. The image on the right says **Start.** Therefore a logging run is not running.

Note: If a logging run is active, and you wish to make changes, you must first hit **Stop.**

Step 2 – If you see the Start button, you can enter a new file name and change the logging interval and warm-up time.

Tap on **Start**, and then tap on **Yes.**

Note: Make sure you remember to turn the logging switch to the ON position!
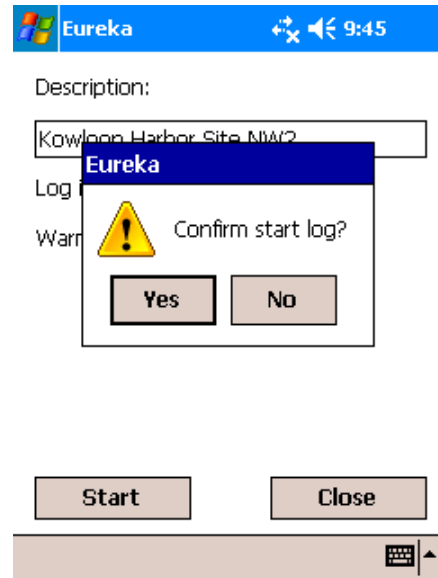
Downloading Data from your Multiprobe

From the Log menu, choose "**Download Sonde File**." A list of available files appears. Tap on the file you wish to download and tap select. The file will be copied to your Pocket PC. You may wish to delete it from the sonde in order to free up more memory for future logged files.
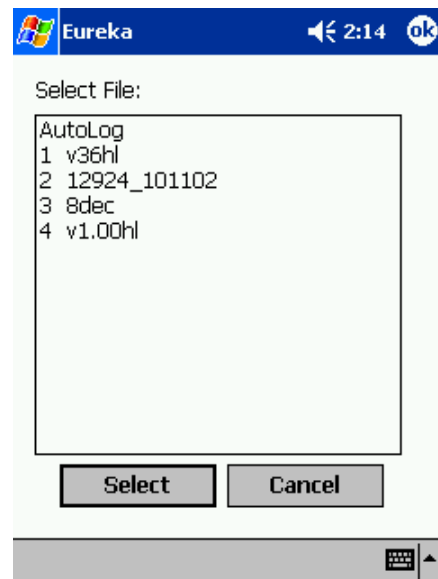
Calibrating Your Instrument

Choose "**Calibrate**" from the "**Probe**" menu.

Choose the parameter you wish to calibrate.
Enter the appropriate calibration point, and stabilization
time. Eureka Amphibian software will remember the last
variables used. Consult your instrument's instruction
manual for appropriate calibration points.

Note: During the stabilization time the Amphibian
software is not recording anything. It is simply a waiting
period for the parameter to stabilize in the calibration
solution. When the stabilization time reaches one second,
calibration information will be sent to your instrument. A
"**Wait**" message will appear. It may take up to 90 seconds
to complete the calibration procedure.

pH Calibration Example

Tap "@7.00 for 30 seconds"   Tap "Yes"
Tap "Calibrate"

Follow the instructions.

At the end of step two, you will get a success message. Make sure to save your changes! Calibration changes do not take effect unless you save the changes. We recommend that you calibrate one parameter at a time, saving changes after each parameter.

NOTE – Eureka remembers the last calibration settings. So if you calibrated at pH 4 and 7, it will default to the same. If you need to change to pH 7 and 10, you must change those first! Click on pH 4, change the 4 to 10, and click OK. Click OK to save changes. Go back to the calibration menu.
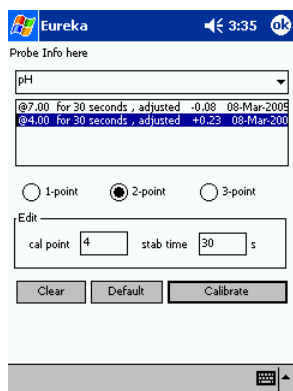
Tap on the cal point you wish to change.	Tap on the keyboard icon Highlight the cal point to change – the number "4"	Tap on @7…, Tap Calibrate Follow the steps above.
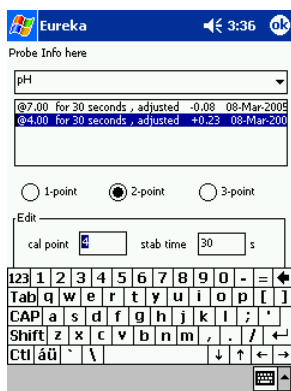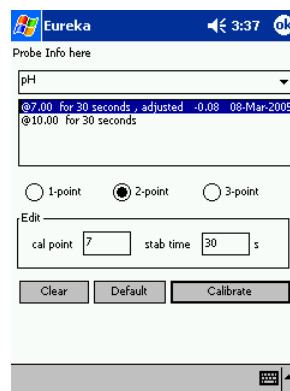
Notebook

The notebook associates Note and Report files with a location file. Each location may have one text, one audio and one drawing note as well as multiple reports created from report templates.

Notes

Basic Note files may be ▦Text, ▦Drawing, or ▦Audio
To access or create a note for a Location, select Locations (Log menu) and select a location by single tapping it. Press the NOTE button. Select the desired note type from the list on the left. Use the EDIT button to edit an existing note or the CREATE button to create a new note. The EDIT button will only be enabled if the selected note type already exists.

For ▦Text notes a simple text editor will be displayed. Tap inside the edit window to activate the cursor. Enter your note text and press the SAVE/CLOSE button to exit the editor. You can use the Enter key to start new lines of text and use the arrow keys to move the cursor through the text. Use the CANCEL/CLOSE button to close the note editor without saving any changes.

For ▦Drawing notes, a simple ink-capture editor will be displayed. Tap the stylus on the screen to draw points. Hold the stylus on the screen while moving it to draw free hand. The UNDO button will remove all points drawn since the last time the stylus touched the screen. The CLEAR button will remove all points. Press SAVE/CLOSE to save the file or CANCEL/CLOSE to close the editor without saving any changes.

For ▦Audio notes, the standard Pocket PC audio control will be displayed. Press the Red record button to start recording. Press the black square to stop recording. Press the green arrow to hear the recording. Press OK when finished. In order for Audio Notes to be playable on your desktop system, they must be recorded in PCM Wave format. From the Pocket PC's Start Menu, choose Settings, then Input, then the Options tab, and select one of the PCM formats for the Voice Recording Format. Eureka recommends 11025 Hz, 8 Bit Mono for best voice reproduction.

Reports ▦

To access or create a Report for a Location, select Locations/Sites (Log menu) and select a location by single tapping it. Press the NOTEBOOK button and then select REPORT from the left list of the Note dialog. The list on the right will display all the available report templates. Select a template and use the CREATE or EDIT button to create or edit a report. The report will be displayed using Pocket Word. See the help for Pocket Word for more information about editor features. Reports are stored in RTF (Rich Text Format) format.
After using Pocket Word to edit the template, press OK to save the file. To return to Eureka, select the Start Menu and Eureka.

Adding/Editing Report Templates

Report templates are stored in Rich Text Format (RTF). The Templates are stored in the folder '\My Documents\Eureka Templates'. Each time you create a report for a location, the report template is copied from this folder to your site folder. If you wish to customize a report template you may edit it in the Templates folder. Use Pocket Word or any other RTF editor to modify the templates. You may also delete templates or add your own templates to this folder. Templates must have the RTF extension and may be given any name.

C H A P T E R 6: Amphibian Desktop Software

Transferring Data from the Amphibian to the Desktop PC

On your desktop, double-click on the Eureka PC icon.

Open Location

To open a location file for viewing, select Open (File Menu). You will be shown the standard Windows File Open dialog box. Select the location file and click the OPEN button. The location file will be displayed on the Location Detail screen.

Location Detail

The file detail screen displays location data files in a columnar format.

Time will always be displayed in the left most column. The date associated with the time values will be displayed on the top left under the column headings and above the data. If more than one day is represented on the screen, the date range will be displayed.

You may navigate through the data readings by using the END, HOME, PAGE UP, PAGE DOWN keys and ARROW keys UP, DOWN. The LEFT and RIGHT arrow keys may be used to scroll through the columns view or you may use the right and left arrow buttons.

You may select a column by clicking on the column heading. The headers of selected columns will appear in boldface. Selecting columns is useful for pre-selecting axes to graph and to select columns that will be exported or copied to clipboard. If there is additional information, for example notes, report templates, or calibration information associated with the displayed locations, icons representing the different types of information will be displayed to the left of the column scroll arrows underneath the readings. Double-click on the icons to see the additional information. They will be opened using the default viewer defined on your system.

Icons

Text Note
Audio Note
Drawing Note
Report Template
Statistics
Calibration Info

Locations

Logged readings are stored in individual data files called location (.loc) files.

Statistics

To view minimum, maximum and average values for the currently displayed location file, select Statistics (View Menu) or select the icon on the location detail screen.

A text file will be displayed showing the minimum, maximum and averages for all measurement parameters. The text file will be opened in your systems default text editor (usually Notepad) where it may be printed Print (File Menu) and copied to the Windows clipboard Copy (Edit Menu). Note: The Statistics information displayed is the min, max and average for all the data contained in the displayed location file. It is not associated with the Automatic or Manual statistics information collected by the Amphibian Pocket PC program.

Create Graph

When viewing a location file, select Create (Graph Menu). The Create Graph dialog will be displayed. There are three tabs in this dialog, Axes, Options and Title. Click on the tab name to switch between the dialogs panes.

From the Axes tab, select the X and Y measurement parameters to graph. The list on the left displays all available parameters. Click on a measurement parameter once to select it and click the SET button set the X-axis or the ADD button to add it to the list of Y-axes. Click on an item in the Y-axes list to select it and click the REMOVE button to clear the parameter. In order to create a graph you must have at least one X and one Y-axis. At the bottom, select the graph type to create. Select Single Y, Multi Y or Strip Graph.

- Single Y will display one or more measurement parameter graphed with a single Y-axis versus an X-axis.
- Multi-Y will display each parameter against an independently scaled and displayed Y-axis and a single X-axis. A legend may be displayed with a multi-Y graph by selecting the Legends check box.
- The Strip Graph displays each measurement parameter with a single X-axis and independent Y-axes stacked vertically.

Click on the **Options** tab to set graph creation options. Click the check mark next to the option to select or clear an option.

- X-Axis Grid, Y-Axis Grid – horizontal and vertical grid lines drawn across the graph corresponding to the tick marks.
- Lines – lines are drawn connecting each data point.
- Markers – larger marker symbols are used for each data point instead of round points
- X Labels, Y Labels – X and Y axes are given text labels.
- X-Axis Date – the starting and ending dates for the current data are displayed above the graph as a secondary x-axis. Useful only when time is selected as the x-axis.

On the **Title** tab, click on Show Title to display a title with your graph and edit the graph title. After selecting at least one x-axis and one y-axis and setting the graphing and title options, the CREATE button will be enabled. Click **Create** to display the graph.

From the location detail screen, you may pre-select the measurement parameters to graph by clicking on the column headers. Selected columns will appear in bold face.

Graph Manipulation

After a graph is created and displayed on-screen:

To display data values:

Move the cursor to a point and leave the pointer steady for a moment without pushing any buttons.

To resize the graph window:

Move the cursor to the edge of the graph window until the arrow cursor changes to the resizing cursor. Click the left button and drag the window edge. The graph will be resized.

To Zoom-in on the data:

To zoom-in on a region of the graph, move the pointer to the top left of the area you wish to expand and press and hold the left mouse button. Drag the mouse pointer to the bottom right corner of the expansion area and release the mouse button. The graph will be resized. To undo your last zoom, select Zoom Out (Graph Menu).
Note: Strip graphs may NOT be zoomed. Zooming on a Multi-Y graph will re-scale all axes.

Copy to Clipboard:

Select **Copy (Edit Menu)** to send the graph image to the Windows clipboard. You can then paste the graph into other applications such as Word and Excel.

Export Data

Location data may be exported to CSV (Comma Separated Values) for use in other applications like Microsoft Excel.

To export a location, first **Open** the location. Select **Export to Excel CSV (File Menu)** or click the Export tool bar button. Select a file name for the exported values and click **OK**. The CSV file will be created and may be opened automatically if a spread sheet editor is registered on your system.*

Note: If there is no spread sheet editor associated with .CSV (Comma Separated Values) files, try one of two things:
Using Windows Explorer, double-Click on the .CSV filename and select the spreadsheet editor program from the "**Open With..**." dialog. Start the spreadsheet editor using the Windows Start Menu and try Importing or Opening the file.

Copy Clipboard

Location data and graph images may be copied to the clipboard for transfer into other applications such as spreadsheet editors, page layout programs and word processors.

Copy Location Data

Select the columns you wish to copy by clicking on the column headers. Selected columns will appear in boldface. If you do not select any columns all columns will be copied.

Select **Copy (Edit Menu)**, the Copy button Tool bar or press Ctrl-C. The location data will be placed in the clipboard as text values and may be inserted into other applications by using the Paste **(Edit Menu)** command.

Copy Graph Data

To copy the graph file, select the **Copy (Edit Menu)** command, left-click the **Copy** button on the Tool bar or press Ctrl-C. The current displayed graph will be placed in the clipboard as a bitmap image and may be inserted into other applications by using the **Paste (Edit Menu)** command.

Transfer Utility

Location, Result and Note files may be moved from the Mobile PC to the desktop PC for analysis and printing using the Transfer Utility.

While using Eureka PC, start the Transfer Utility by selecting the Transfer tool bar button or **Transfer (File Menu).** You may also start Transfer by selecting the Start Menu button from your Windows task bar and selecting Programs, Eureka and Transfer. Disconnect the probe from the Amphibian and attach the cable between your Amphibian and desktop PC. The Transfer Utility will automatically connect to the Amphibian.

Once connected, the location folder structure contained on the Amphibian will be displayed. By default, the contents of \My Flash Disk\Eureka folder will be displayed. Use the drop-down list of available memory on the Amphibian to switch between Internal RAM Memory (\My Documents\Eureka), Internal Flash Memory and removable Storage Card Memory (ACC-CFxx) if installed in the device.

The Transfer Dialog works in a similar fashion to the Windows Explorer. You can expand and collapse site tree items by right-clicking the plus and minus signs that appear in front of folder icons. You may select site folders by clicking on the name. A selected item will appear in reverse.

The same folder structure created on the Amphibian will be created on the desktop PC in the data files folder selected during installation. (By default a folder named Eureka is placed on your desktop during the initial installation.) Use the Overwrite Destination buttons to select the action when site and location names already exist on your desktop system. Select Prompt to be prompted before overwriting data files, Always to overwrite existing files or Never to skip transferring existing files. Select If changed to only transfer files that have changed since last transfer. (File sizes are compared to determine if a file has changed.)

Location data files can be automatically removed from the Amphibian after they have been transferred to the desktop PC. If you wish to delete files after they are moved, check the 'Remove from Mobile Device after successful transfer' checkbox. Removing files from the Mobile PC will free up memory space on the device.

Use **the VIEW LOG** button to view a detailed log of files transferred, deleted and any errors that may have occurred.

Use the **SET DESTINATION** button to change the default location where transferred files will be stored on your desktop PC.

Notes
- Although only .LOC location files are displayed, all note, templates and calibration files associated with the selected location are also moved and (if applicable) deleted.

- Empty location files created on the Mobile PC that have not yet been logged to will NOT be transferred to the PC.

Transfer Utility Communications Troubleshooting

In order for the Transfer Utility to work, the Amphibian (in the case or Pocket PC) and Desktop PC computers must be linked to your Desktop PC. The actual transfer is performed by a communications routine. This is typically **Microsoft's ActiveSync** but may also be **Eureka's Link** serial transfer program. The Transfer program dialog will display the connection mechanism in the title bar.

Use the **Transfer Settings (File Menu)** to control which mechanism is used to transfer files. Auto Detect attempts to determine if ActiveSync is installed on your system.

ActiveSync Troubleshooting

The link between the Amphibian and PC should automatically initiate when the USB or Serial cable is connected between the two computers. If it does not, try the following:
- Check the cable connection
- On the Amphibian, select Start Menu, ActiveSync and press the **SYNC** or **CONNECT** button.
- If communications will not initiate, shut down the Amphibian software, reset the Pocket PC via the recessed reset button, and re-attach the serial cable. See the Appendix section for more information.
- Confirm PC connection is enabled on the Mobile computer:
  - Amphibian: From Start Menu, select ActiveSync, Tools menu, Options, ENABLE checkbox for 'Enable Synchronization when cradled'.

  - On the Desktop PC, Start ActiveSync from Start Menu, Programs and select Get Connected (File Menu). This will walk you through the steps in initiating a connection.
  - Make sure there are no other applications running on your desktop PC and Amphibian that might be using the serial port. LapLink, HotSync and some fax programs will utilize the serial port even if you are not actively using them.

When the Amphibian and PC are connected via ActiveSync, the green connection icon will appear on your PC's task bar and the connection icon will be displayed in the Transfer Utility dialog box.

Microsoft ActiveSync Update

Microsoft's ActiveSync 3.71 is available for free from:
http://www.microsoft.com/windowsmobile/resources/downloads/pocketpc/default.mspx

A P P E N D I X

Error Messages and Troubleshooting

USB Device Not Recognized

If the following error appears when connecting the Amphibian to a PC:

> ⚠ **USB Device Not Recognized**   ✕
>
> One of the USB devices attached to this computer has malfunctioned, and Windows does not recognize it.
> For assistance in solving this problem, click this message.
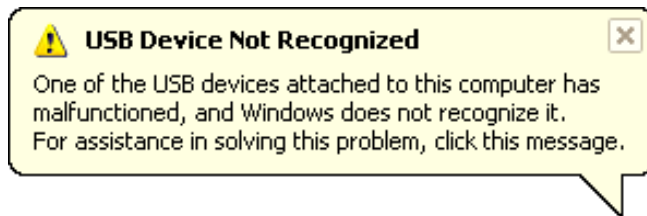
Fix 1:
Unplug your Amphibian from the USB port. Wait one minute, and reconnect.

If you get the same message again, make sure you are not running any programs.
> Tap Start
> Tap Settings
> Tap System
> Tap Memory
> Tap Running Programs
> Tap Stop All

Wait one minute, and reconnect.

Fix 2:
In the ActiveSync window on your PC, click "File" then, "Connection Settings". Make sure "Allow USB connection with this desktop" is checked. Depending on your PC configuration, allowing for serial or infrared connections to the COM port may cause connectivity problems. It is recommended that this box remains unchecked.
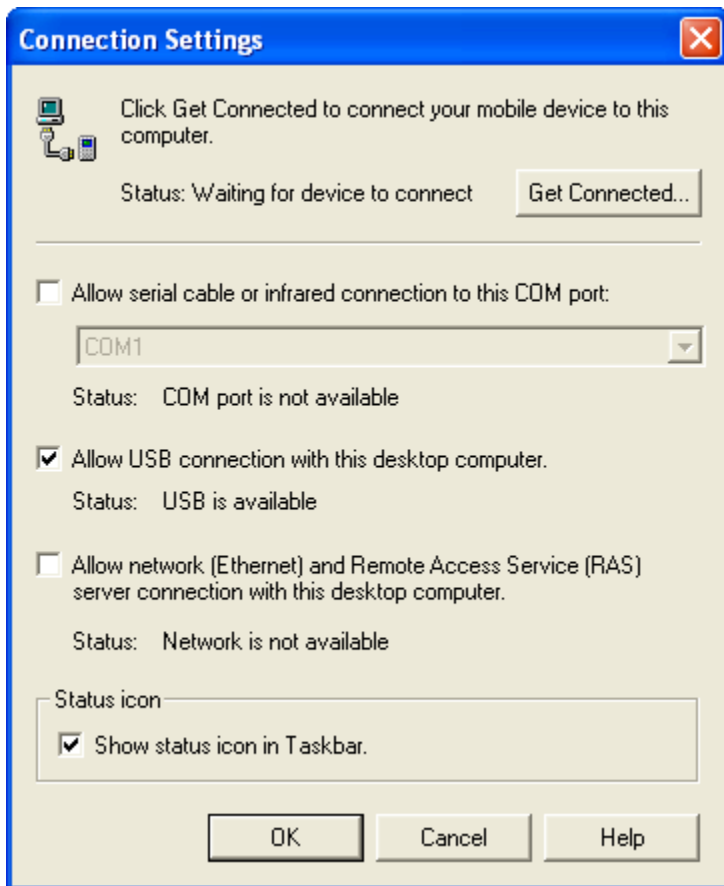
If the above solutions do not help, a soft reset of the PDA might be needed (**See Below**).

If "Program not responding":

Tap on the Windows flag / icon in the top left.

Tap "**Settings**."

Tap "**System**."

Tap "**Memory**."

Tap "**Running Programs**."

Tap "**Stop All**."

Tap "**OK**."

*If the PDA is completely locked up a soft reset may be necessary.

Soft Reset of the Pocket PC (the control-alt-delete salute):

Disconnect the Amphibian form the PC. Open the Amphibian case so you are looking at back of the PDA. If you have a HP Ipaq, the reset button is in the bottom left corner. If you have a Viewsonic, the reset button is also on the back labeled "Reset". Press the recessed button and wait for the PDA to restart itself. Reconnect the Amphibian. It's also a good idea to restart your PC to ensure the new settings have taken effect.

Unable to Connect to your Multiprobe

The most likely reason is that your battery is not fully charged. If there is not enough power, you will be able to run the Pocket PC and the Eureka program, but you will not be able to communicate with your multiprobe. Charge your battery, or connect to the car charger or boat battery charger.

Unable to View a Parameter

The Amphibian is not able to add parameters to the display. On YSI and Hydrolab instruments, you must first enable parameters using Hyperterminal or Ecowatch.

Connecting to a YSI instrument

In order for the Amphibian to work properly with YSI instruments, you must make sure that the Auto Sleep RS232 option is not activated.

Step One – Connect your YSI instrument to your PC and start Ecowatch™

Step Two – Choose "Terminal" from the "Comm" menu

Step Three – Choose your comm. port and begin communication

Step Four – Choose "6 – Advanced"
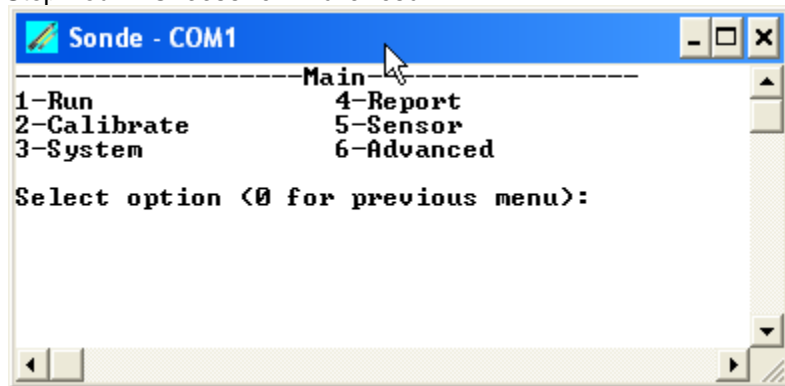
Step Five – Choose "2 – Setup"
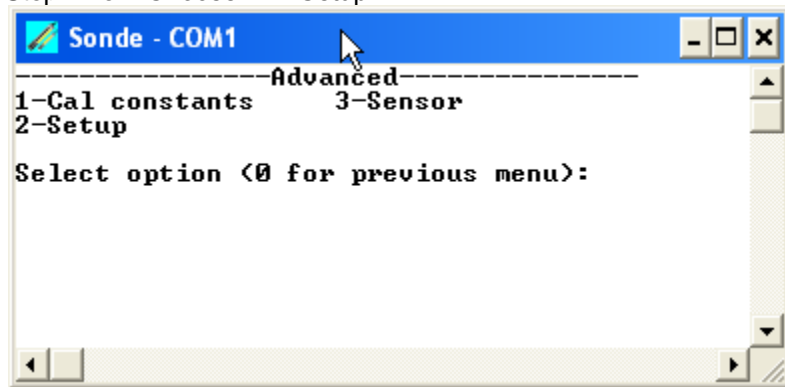
Step Six – Make sure Auto Sleep RS232 is not activated
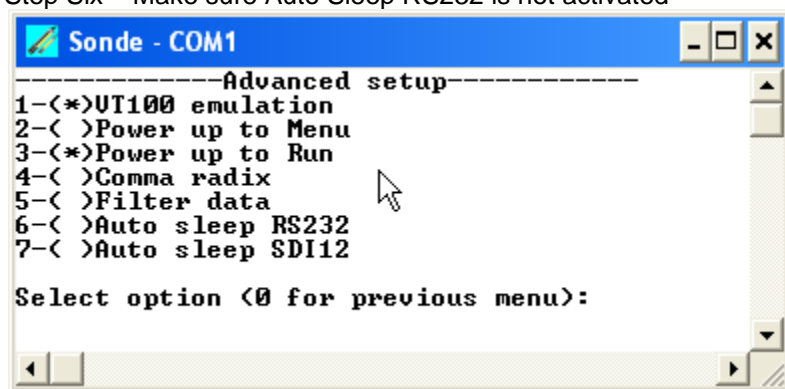
Enter 6 to toggle activation. Enter 0,0 and then exit Ecowatch™

Other YSI Options: Eureka Amphibian software attempts to communicate with YSI sondes at 9600 baud rate.

Eureka Amphibian software will not communicate with YSI 6000 instruments.

Hydrolab Connection Settings

Make sure your Hydrolab is set up to communicate at 19,200 baud rate.

Make sure you have installed Main, MPL Motherboard software version 3.0 or greater on your Series 4 or 4a instrument. For more information on this software version please visit the Hydrolab web-site at www.hydrolab.com.

Battery Charging

The Amphibian battery is designed to be fully charged in three to four hours. When the charger detects the battery at full charge, it drops to a trickle mode to maintain the charge (flashing light).

Long Term Storage

A Pocket PC never shuts off. It is constantly drawing power to store contact information, calendar, clock, and other software applications. If you are not going to use your Amphibian for a long period of time, its best to remove the Pocket PC from the Amphibian and connect it to the docking cradle/charger cable provided by the Pocket PC's manufacturer.

Reloading Software

If the Eureka software ever needs to be reinstalled on your Pocket PC/PC, you can run the installation program on the Eureka CD-ROM that was shipped with your Amphibian. Alternatively a compressed version of the program is loaded into the non-volatile flash memory or external flash card on your Pocket PC.
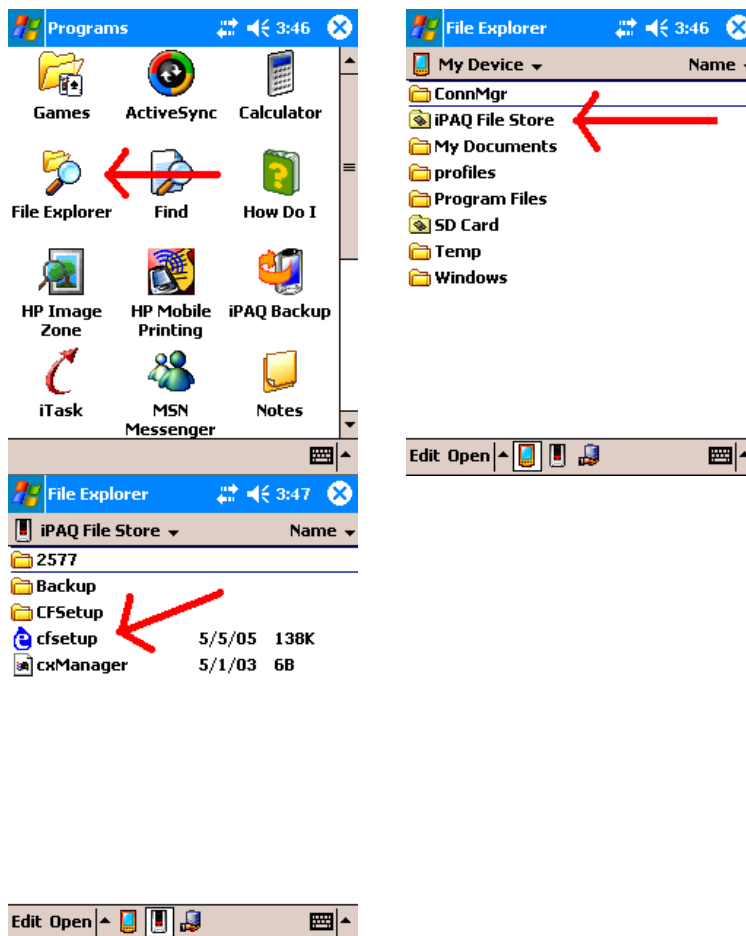
Launch File Explorer

Select My Device on the grey tool bar and tap iPAQ File Store

Then tap cfsetup (with the Eureka teardrop icon)

Warranty for Eureka Environmental Engineering Products

Summary

If your Eureka product fails because of a defect in materials or workmanship within two years of shipment, we will repair or replace it at our cost. In the meantime, we have no idea how you're going to use your Eureka product, and so cannot accept any responsibilities aside from repair or replacement. We cannot warrant the product for any application, nor can we bear any responsibility for any problem or loss that the product may cause. You are responsible for everything else related to the product except warranty repairs. If the product explodes and injures your cat, we're not responsible or liable. If you lose critical data, we're not responsible. If you slip on your Eureka cable while shopping at WalMart, you can sue WalMart, but not us.

Limitations

This warranty is made by Eureka Environmental Engineering and is accepted, as a condition of purchase, by the purchaser or user of Eureka products. There is no other implied, written, or oral warranty, or warranty for fitness for any purpose or application. The purchaser and/or user, and not Eureka, assumes all risks, liabilities, and responsibilities for the purpose and use of any Eureka product in any application.

Coverage

All new Eureka products, and all Eureka products labeled "factory refurbished", are warranted by Eureka to be free of defects in materials or workmanship for two years after the date of the initial shipment from Eureka to the purchaser or user. This warranty does not cover components, such as batteries, calibration standards, sensor filling solutions, and dissolved oxygen sensors that are subject to shelf lives or, by their very nature are consumed by normal use. Any components which have been damaged through misuse, alteration, accident, or unauthorized repair are not covered by warranty.

Responsibility

Eureka will repair or replace, at its option and at no charge to the purchaser or user, any product found to be defective in materials or workmanship during the warranty period. Repair or replacement is Eureka's sole responsibility, and the purchaser's or user's sole remedy in the event of a warranty claim. Eureka is in no way responsible for, or liable for, any contingent or consequential damage or expense resulting from a defective product, including inaccurate or lost data. Eureka's sole obligation is repair or replacement of the defective product.

Procedure

Should you have a problem with a Eureka product, please contact Eureka's Customer Service staff at 512-302-4333 or at support@EurekaEnvironmental.com. If your problem cannot be remedied by the staff, you will be issued a return-product number and asked to send your product to Eureka at 2113 Wells Branch Parkway Suite 4400 Austin, TX 78728.

Manta

Water Quality Multiprobe

Startup Guide

Eureka Environmental Engineering
2113 Wells Branch Parkway Suite 4400
Austin, TX 78728

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Version Information

June 4, 2004 – First version
March 12, 2005 – Added battery pack info
June 8, 2005 – Added long term storage information
July 12, 2005 – Updated specifications and added battery pack information
August 24, 2005 – Updated battery pack, new address information, DO% Sat specification
October 28, 2005 – Added Manta internal battery pack information
November 30, 2005 – Added ammonia sensor information
January 25, 2006 – Updated turbidity calibration procedure
January 30, 2006 – Updated Manta external battery pack photos
June 8, 2006 – Updated Optical Dissolved Oxygen

Table of Contents (Manta)

Eureka Manta Startup Guide

Things you need to know – **Read This Page First!**

The Eureka Amphibian display allows you to view data as well as calibrate the instrument. You may choose to connect the Manta to a desktop PC in order to calibrate more easily.

Setup Steps

I Place the Eureka Install Disc into your cd-rom drive. Starting at the top of the menu, install Microsoft ActiveSync and the Pocket PC drivers onto your PC. Then Install the Eureka Manta software. Complete Amphibian installation instructions are in the Amphibian manual.

II Connect your Manta to the Amphibian or PC and calibrate your Conductivity, Dissolved Oxygen, pH, depth or any other parameters.

III Go collect data!

IV Upload data from the Amphibian to your PC.

Typical Performance Specifications

Parameter	Range	Accuracy	Resolution
Temperature	-5°C – 50°C	±0.1°C	0.01°C
Clark Cell Dissolved Oxygen (mg/L)	0 – 50 mg/L	±0.2 mg/L ≤20 mg/L ±0.6 mg/L > 20 mg/L	0.01 mg/L
Dissolved Oxygen (% Sat)	0 – 200% 200 – 500%	±2.4% ±7.2%	0.1
Optical Dissolved Oxygen (mg/L)	0 – 25 mg/L	1% of reading or 0.02 mg/l, whichever is higher	0.01 mg/L
Dissolved Oxygen (% Sat)	0 – 200%		0.1
Specific Conductance	0 – 5 mS/cm 5 – 25 25 - 112	±1% reading ± 0.001 ±1% reading ±1% reading	4 digits
pH	2 – 12 units	±0.2 units	0.01 units
ORP	-999 - +999 mV	±20 mV	1 mV
Salinity	0 – 70 PSS	±1% of reading ± 1 count	0.01 PSS
Depth	0 – 25 m	± .2% meters	0.01 m
	0 – 50 m	±0.2%	0.01 m
	0 – 100 m	±0.05 meters	0.01 m
Depth - Vented	0 – 33 ft	±0.005 ft	0.001 ft
Turbidity	0 – 3000 NTU	<1% reading to 400 NTU < 3% reading over 400 NTU	4 digits
Ammonia/Ammonium	0 – 200 mg/L - N	± 10% of reading or ± 2 mg/L-N whichever is greater	0.1 mg/L - N

Performance specifications are affected by calibration and maintenance. For best results, clean and calibrate your instrument on a periodic basis.

Calibrate near sample conditions for best results.

See the sections in this quick start guide on calibration and maintenance for more information.

Manta Components

Above – Manta with weighted sensor guard and Amphibian

Manta Components:

Your Manta was shipped with the following components:

Manta Multiprobe – each unit is custom configured.

Cable – The detachable under water cable is affixed to the multiprobe

USB Cable – Use this cable to connect the Manta to your computer via a USB port. **Do not use the USB adapter cable to attach any other serial device!**

Storage Cup – The storage cup ships with a few ounces of tap water to keep the sensors moist. Do not overfill, and do not allow to freeze. Do no store in anything other than tap water.

Calibration Cup – Used when calibrating the sensors. The rubber cap prevents leaking, but is not recommended as a storage cup as it easy easily knocked off.

Weighted Sensor Guard – Remove the storage cup and install the weighted sensor guard before deployment

Maintenance Kit – Contains spare DO membranes, DO electrolyte, pH reference, and o-ring grease.

Quick Start Guide – this manual

Software Included:

There are two pieces of software required for the Manta and two pieces required for the Amphibian.

Manta:

Manta Desktop Software – allows you to connect the Manta directly to your PC. You can view data, setup logging files, and calibrate your instrument.

USB to Serial Driver – The Manta connects directly to a USB port on your PC. This software allows your PC to recognize the Manta. The original driver disc is included with your Manta, but has also been copied onto the Manta Installation Disc "2".

Amphibian:

ActiveSync and Pocket PC drivers – This software allows you to connect your Pocket PC to your computer through a USB port.

CD-Rom with PC software – contains software allowing you to connect the Manta directly to a PC through the USB port.

Connecting the Manta Multiprobe to the Amphibian Display

Note – Steps 3 and 4 are crucial! This is a known feature, and will be corrected in a future release.

Step 1 – Install software according to the Amphibian User's guide

Step 2 – Make sure your Amphibian is fully charged

Step 3 – Plug in the Manta to the Amphibian and secure with the thumb screws

Step 4 – Wait 10 – 15 seconds, watch the power indicator lights in the Manta housing. When the green light is at a steady 1 second flashing rate, turn on the Amphibian by pressing button four. See picture below for location of button four.

Press this button to turn on the Amphibian

Important notes:

As long as the Manta is connected to the Amphibian, it will continue to operate.

If you disconnect the Manta, exit the Eureka program, plug in the Manta to the Amphibian, wait 10 – 15 seconds, and start the Eureka application again.

Connecting the Manta to a PC

1) Install Software

Insert Eureka Disc "2" into your computer's cd-rom drive. Follow the instructions to install the Eureka Manta software.

Next, install the USB driver. This software is also located on Eureka Disc "2".

2) Connect the Manta to the PC with the USB adapter cable supplied with your Manta

3) Launch the Eureka Manta software. There is a shortcut on your desktop to launch this application.

4) To disconnect, simply unplug and exit the program.

Using the Manta in the Field

Step 1) Calibrate your instrument if necessary.

How do I know if I need to calibrate?

The simple answer is that frequent calibration will generally give you better data.

Sensors will behave differently depending on operating conditions. If you replace the DO membrane or pH reference, you need to recalibrate. If you are using your multiprobe across vastly different environments, you may wish to calibrate certain sensors depending upon the environment. For example, if you are monitoring in fresh water, calibrate with a low conductivity solution. If you then need to monitor in salt water, recalibrate conductivity with a high conductivity solution to ensure best accuracy. If you are moving between alkaline and acidic waters, you may wish to calibrate pH more frequently. Turbidity as well may benefit from frequent calibration if you are using the instrument in a wide range.

If you are uncertain whether you need to calibrate, check the sensor readings against a known sample. If the reading is within the accuracy specification, there is no need to calibrate.

Step 2) Remove the storage cup and install the weighted sensor guard

Step 3) Connect the Manta to your Amphibian. Wait 10 -15 seconds and turn on the Amphibian

Step 4) Collect data. In between sites, you can unplug the Manta from the Amphibian.

Note – The Manta does not need power to store calibration information. You do not need to recalibrate just because you have turned off the instrument!

Cleaning and Maintenance

Overview Diagram

	Cleaning	Routine Maintenance
Cable	DO: Wash with warm, soapy water DO NOT: Clean with acetone or other substances which may damage the plastic	None Required.
Housing	DO: Wash with warm soapy water. DO NOT: Use abrasive materials, as this may scratch the housing.	None Required.
Temperature Thermistor	Wash with warm soapy water.	None Required.
Conductivity Sensor	DO: Gently clean the inside with a cotton swab. You may use a little rubbing alcohol or warm soapy water. DO NOT: Use sandpaper or other abrasive materials.	Clean if biological growth or mud is present.
Clark Cell Dissolved Oxygen Sensor	DO: Wash sensor stem with warm soapy water. Using a soft cloth, and a little bit of alcohol, you may clean the membrane. DO NOT: Use any abrasive materials to clean membrane.	For profiling applications when the Manta is used for only several hours a day, and it is stored in water, the membrane and electrolyte should last for several months. Replace membrane if there is a wrinkle, or hole, or if it appears baggy or dirty. Flush with fresh electrolyte solution when replacing membrane. If there is a large air bubble under the membrane, replace membrane and electrolyte. If your dissolved oxygen sensor will not calibrate, replace membrane and electrolyte.
Optical Dissolved Oxygen Sensor	DO: Wash sensor with warm soapy water. Using a soft cloth you may clean the sensing element. DO NOT: Use any abrasive materials to clean sensing element..	None Required. Check calibration at least annually.

pH Sensor	DO: Clean flat glass pH bulb with a soft cloth and alcohol. DO NOT: Use any type of abrasive materials on the glass	None Required.
pH Reference	DO: Clean junction (the white part in the middle of the black tip) with a soft brush. DO NOT: Attempt to clean a discolored junction, as this is a normal occurrence.	Replace reference solution periodically. Replace (refill) reference if there is an air bubble. Replace the junction (tip) if it is clogged and will not allow reference solution to pass through when you replace the reference.
ORP	Clean the platinum electrode with a soft toothbrush when cleaning the pH bulb. Be careful not to scratch the pH bulb.	None Required.
Depth / Vented Level	Make sure there isn't anything blocking the sensor opening. Use a stream of water to remove any algal growth. Do not stick anything into the opening.	None Required.
Turbidity	Clean optics with warm, soapy water. Take care of the optical window! Do not allow this to be scratched.	We recommend periodic inspection of the wiper pad to determine if the material is deteriorating or is impregnated with material from biofouling. In addition, as a precaution we recommend changing the wiper prior to each long term deployment.

Storage: When not in use, store your Manta with a small amount of tap water only in the storage cup. Do not allow to freeze.

General Cleaning Instructions

Clean your instrument periodically with warm soapy water. Liquid dishwashing soap is fine. Do not use abrasives. Do not use acetone. Do not clean with gasoline, kerosene, or industrial cleaners. Fantastik or 401 cleaners may be appropriate.

Clean sensor stems with a soft brush. See chart for specific cleaning instructions for individual sensors.

Clark Cell Dissolved Oxygen

Periodically you may need to remove and discard an old membrane, fill the dissolved oxygen cell with fresh electrolyte, and re-close the cell with a fresh, clean membrane. The electrolyte in the prepared cell should be free of air bubbles. The membrane, clean and free of fingerprints, should be tightly stretched over the cell with no wrinkles. Eureka's unique pop on membrane cap virtually eliminates wrinkles, but care must be taken during the process.

1) Remove the DO membrane cap and discard the old membrane by pulling up on the cap.

2) Empty the old electrolyte solution and refill with a fresh supply. Take care to not introduce any air bubbles. Fill the cell as full as possible, creating a large droplet on the surface.

3) Select a membrane, handling only on the corners. Gently place the membrane on top of the dissolved oxygen electrolyte, taking care to prevent air bubbles from being trapped underneath.   If there is an air bubble, remove the membrane, top off with more DO electrolyte, and replace the membrane.

4) Place the DO membrane cap over the DO cell. Make sure the o-ring inside the cap is at the top. This o-ring will grab the membrane and stretch it uniformly.

5) Trim any excess membrane material with a pair of scissors.

6) Inspect the membrane for air bubbles or wrinkles. If any exist, go back to step one.
7) This completes dissolved oxygen probe preparation. It is best to let a freshly prepared DO probe age for 24 hours before it is calibrated. Do not leave it exposed to air for long periods. Place a few teaspoons of water in the storage cup and secure to the sonde.

Note: If the calibration of the DO sensor is checked at regular intervals after a fresh membrane is installed, it will be found that the sensitivity of the sensor decreases by two or three percent or more during the first 24 hours, with most of the decrease occurring during the first 12 hours or so. This is caused by a reduction in membrane permeability, due partly to a relaxation of stresses in the membrane and partly to the response of the membrane material to exposure to water. After about 24 hours, the sensitivity of the probe becomes very stable.

To realize the very good stability of which the sensor is capable, it is recommended that you wait 24 hours before calibrating after installing a new membrane. This aging process should not be done in air, but place a few teaspoons of water in the storage cup and secure to the Manta.

It is perfectly all right to use a freshly prepared probe immediately, however the probe should be calibrated every four hours or so for best data during the first day.

pH Reference

Replacing the pH reference periodically is important for good data.

1) Remove the reference sleeve by pulling straight down.

2) Replace with fresh pH reference electrolyte (KCl saturated with Silver Chloride). Be careful not to introduce any air bubbles.

3) Place the reference electrolyte chamber over the electrode in the sleeve receptacle, and turn instrument sensor end up.

4) Push down on the sleeve to fix it in place. This will allow any trapped air bubbles to escape through the junction. You might want to tap on the sleeve gently if there are any air bubbles stuck on the side.

5) Rinse well with tap or DI water.

Wipered Turbidity

The effectiveness of the wiper in maintaining a clean optical surface will eventually be compromised, the rate being dependent on the water under investigation and the number of wiping cycles carried out. We recommend periodic inspection of the wiper pad to determine if the material is deteriorating or is impregnated with material from biofouling. In addition, as a precaution we recommend changing the wiper prior to each long term deployment. The wiper is a consumable item. Wiper packs are available from Eureka Environmental (NEP19WIPE).

To change the wiper, loosen the set screw with the 1.5mm hex key provided until the wiper can be removed from the shaft. Place a new wiper on the shaft so that the set screw in the new wiper faces the flat on the shaft. Gently press the wiper against the face of the probe until the foam pad is compressed to roughly three quarters of its original thickness and then tighten the set screw. It is important that the wiper arm body does not make contact with the probe face – only the pad should be in contact. A gap of 0.5mm between the wiper body and the probe face is typical when a new pad has been installed.

CAUTION: Do not over-tighten the set screw or manually attempt to rotate the wiper arm once set onto the shaft.

Calibration Procedures

General Procedures

1) Clean and perform routine maintenance if necessary.
2) Rinse sensors thoroughly (more than once may be required) with DI (deionized) water between calibrations. Shake the transmitter vigorously to remove traces of old calibration solutions – repeat if necessary.
3) Select a calibration standard whose value is near to your representative field sample. For example, if your pH is generally alkaline, choose pH 7 and pH 10.
4) Rinse the sensors twice with a small quantity of your calibration standard. Discard and do not reuse calibration standard.
5) Secure your Manta with the sensors pointing up, and fill the calibration cup as required to perform the calibration.
6) For best results, use fresh calibration solutions, and discard once they have been used.

Temperature

This sensor is factory calibrated and does not require calibration

Clark Cell Dissolved Oxygen (% Saturation Method)

If you have replaced the membrane, it is best to wait 24 hours before calibration.

1) Fill your calibration cup up to the level of the DO membrane with a tap water, DI water, your conductivity standard, or a pH standard. Contrary to other manufacturers, Eureka allows you to use high salinity standards during an air calibration.

2) With a paper towel, make certain the membrane is dry and free of water droplets.
3) Place the black rubber cal cup cover upside down over the calibration cup.

4) Wait approximately two minutes for the air to become fully saturated and the temperature to equilibrate. Make sure your circulator is turned off. Follow the calibration procedures on your Amphibian or on the desktop software.
5) DO % saturation also calibrates DO mg/L.
6) If you used pH buffer or Conductivity standard, add more to your cal cup and proceed to that calibration.

Optical Dissolved Oxygen

The optical dissolved oxygen sensor can be calibrated either with 100% water saturated air, or the recommended method with a zero oxygen sodium sulfite based standard. The advantage to the zero oxygen solution is that peak signal output from the sensor is actually at zero mg/l.

The sensor is very linear, and may require less frequent calibration than Clark cell dissolved oxygen sensor. Clean sensor before calibration and follow the steps on the Manta Manager or Amphibian software to calibrate.

pH Calibration

pH is a two or three point calibration. Choose your calibration buffers to bracket the likely pH of your sample waters.

1) Rinse with a pH buffer, and then fill the calibration cup with enough buffer to cover both the pH glass bulb and reference.
2) Follow the instructions on your Amphibian or PC to perform the calibration.
3) Discard the buffer, rinse with second buffer. Add second buffer to cover pH glass and reference. Calibrate with second buffer.
4) Repeat steps 2 & 3 if you are performing a three point calibration.

Note – the order of pH buffers is not important, and using pH 7 buffer is not required.

ORP Calibration

ORP is a one point calibration.
1) Thoroughly rinse the sensors to remove any other calibration solutions.
2) Rinse the with ORP standard.
3) Add ORP standard to cover the ORP electrode.
4) Follow the instructions on your Amphibian or PC to perform the calibration.

Conductivity Calibration

This procedure calibrates specific conductance and salinity.

1) Fill the calibration cup to cover the conductivity sensor. Tap gently on the cup to make sure there aren't bubbles trapped in the conductivity sensor.
2) Follow the instructions on the Amphibian or Manta PC software to calibrate the sensors.

Depth Calibration

Depth is a one point calibration, which should be done in air to set the zero point.

1) Make sure there is no water in contact with the depth sensor. Shake it a bit if necessary.
2) Follow the instructions on the Amphibian or Manta PC software to calibrate the sensors.

Wipered Turbidity Calibration

Because a turbidity probe is inherently an optical device, care must be taken during calibration to ensure that external effects are kept to a minimum. This is best implemented by placing calibration solutions in dark, leak-proof bottles with a non-reflective finish such as Nalgene® 2106 bottles in amber. These are available with wide necks and a nominal capacity of 1,000ml.

Another important factor is cleanliness. Any debris or water that makes its way into the calibration solutions will affect its value and adversely affect the proper calibration of an instrument. It is therefore a good practice to have an ample supply of distilled de-ionized water and a means of properly drying the probe end (clean compressed air is ideal).

Probes should be flushed in two containers of distilled water with thorough drying in between and before insertion into a calibration solution. Also calibration should commence at a lower value (usually zero) and work up in value to further minimize the effects of cross contamination.

Analite turbidity probes are best calibrated using clear copolymer microbead solutions, as they are stable and safe. Other solutions may be used such as formazin but these are normally not as stable and should be treated with caution as they may contain carcinogens.

Calibration Procedures

Hold the probe a few degrees from the vertical and gently tap it on the calibration cup so as to dislodge any air bubble on the optic face. If the probe is properly placed the value indicated will not vary if the probe is gently moved a few millimeters in any direction.

Turbidity is a two-point calibration procedure. The McVan sensor has excellent linearity, but for best results choose a second point near the anticipated reading. The first point must be zero.

Ammonium and Ammonia Calibration

The Eureka Ammonium (NH4+) sensor is an ion selective electrode much like a pH probe, where the pH sensitive glass is replaced by a modified plastic ammonium ion (NH4+) selective membrane. The probe has an internal reference electrode and a filling solution that contains a fixed amount of an ammonium salt. The difference in NH4+ concentration between the filling solution and the sample water creates a potential across the membrane, which is measured with respect to the Eureka reference sensor that is shared by pH, ORP, and NH4+. The membrane potential is linearly related to the logarithm of the ammonium activity, with an approximate 59 millivolts change for every 10 fold change in ammonium activity at 25 degrees C.

Sensor Description   All ion selective electrodes actually respond to ion "activity", which can be lower than the actual ion concentration when there are enough total ions in solution to "shield" the ion of interest. Eureka uses the conductivity of the sample water to estimate its ionic strength, and then uses the composition of average river water to correct the activity to actual concentration of NH4+.

The Eureka ammonium sensor directly detects ammonium ions (NH4+). At higher pH, NH4+ is converted into the more toxic dissolved ammonia gas, or NH3. Eureka's internal embedded software uses the pH, conductivity, and temperature of the sample water to calculate free ammonia gas (NH3_G mg/L-N) and Total Ammonia (NH3-T mg/L-N). The default is to display Total Ammonia, with the other options selectable by the user. It is common to use concentration units of mg/L-N (i.e., concentration of total nitrogen present as ammonia or ammonium), since using this unit will eliminate apparent changes in Total Ammonia if a pH change causes a shift in the equilibrium between NH3 and NH4+.

Interferences   All NH4+ Ion Selective Electrodes are subject to interferences from positive ions, especially potassium and sodium. 1,000 mg/L of sodium or 10 mg/L of potassium ions will cause at least a 1 mg/L-N increase in the apparent NH4+ reading. In fresh water, potassium is the primary interference, raising apparent NH4+ values by 0.1-0.2 mg/L-N in average 200 µS river water. In brackish or marine waters, sodium can become the primary interference because of its high concentration, with ammonia-free sea water reading up to 12 mg/l-N NH4+.

Calibration   As with all Eureka calibrations, calibrating the Ammonium sensor is easy to do. Because of the logarithmic nature of the sensor response, a 2 point calibration is required. Eureka recommends calibrating with its Ammonium calibration solution of 4.63 mg/l – N and 46.3 mg/l – N.

The slope value vs. voltage is a function of temperature; while Eureka attempts to correct for temperature changes using accepted theories, calibrating your ammonium sensor near the temperature of your water sample increases the accuracy of the measurement. It is therefore recommended that you store your Ammonium Calibration solutions and Manta multiprobes at the same temperature as your water sample. The sensor slope may drift slowly over time and should be calibrated periodically, according to the following procedure:

1) Rinse with the first calibration solution, and then fill the calibration cup with enough solution to cover both the ammonium and reference sensors.
2) Follow the instructions on your Amphibian or PC to perform the calibration.
3) Discard the solution, rinse with deionized water, and repeat Steps 1-2 with the second calibration standard.

Note: Calibration of the Ammonium sensor should be calibrated at the same temperature of the multiprobes and water sample.

Maintenance   It is best not to let your NH4+ sensor dry out. Store it in the calibration cup with a small amount of water to insure 100% humidity. For care of the reference electrode, see this Guide's section on pH.

Battery Pack

The Manta Battery Pack

The Manta Battery Pack (MBP) is a watertight (to 100 meters) housing with a cassette for eight batteries, on/off switch for the logging function, and a data port. The data port lets you connect your MBP-equipped Manta to a PC for dumping logged data, or for calibrating the Manta sensors.

When the MBP is fitted to the Manta multiprobe in place of the standard cable-type top cap, the Manta can log water-quality data automatically for up to 30 days or more without the need for external power.

It's really cool because you can see into the housing to spot leaks, and make sure nobody ripped off your batteries to use in another unit. And, the MBP has a simple on/off switch so that you don't have to type endless strings of digits into a computer in hopes that the logger will somehow start logging when you get to the field.

Installing the Manta Battery Pack on Your Manta

If your Manta doesn't have a MBP, but you have a MBP just sitting there doing nothing, then you can turn your Manta into a logging Manta all by yourself. You will need the parts shown below: Manta, MBP, Allen wrench, silicone grease, medium-sized flat-blade screwdriver, plastic bag, mild soap and soft brush, and paper towels.

1) If your Manta or MBP has any dirt, algae, or other contamination on it, use the brush and soapy water to clean all the external surfaces. Also, notice that the o-ring seals appear as two narrow black lines of consistent width (below). That indicates a good seal.
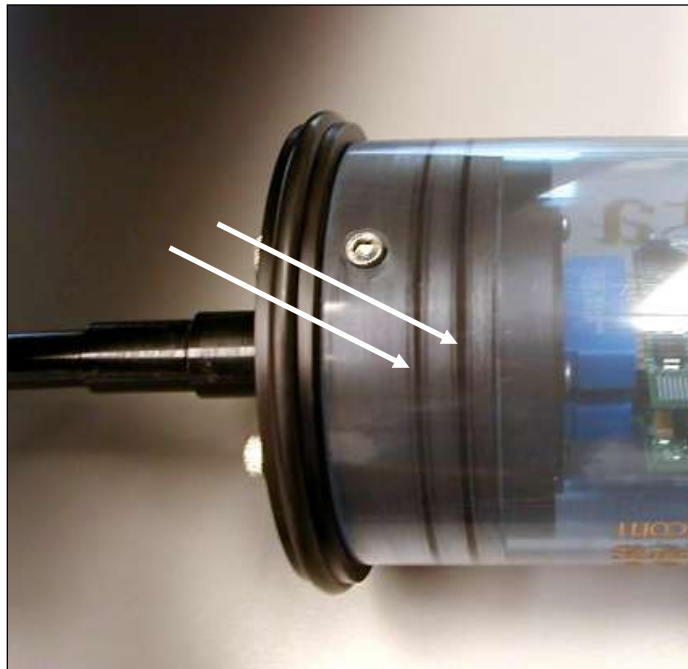
2) Remove the two Allen-head cap screws from the Manta's top cap. Grasp the Manta in both hands and use your thumbs to press the top cap out of the housing. If you can't easily remove the top cap by pushing it with your thumbs, then gently pry the top cap loose with the screwdriver. Pull the top cap completely away from the Manta, and clean any contaminants from the top cap and o-rings. Store the cable and top cap in a clean plastic bag.

If one or both of the circuit boards came out when you removed the top cap, you'd be in really big trouble and facing a huge repair bill if you had one of the lesser multiprobe brands. But with Eureka's Manta, all you have to do is pick up the two circuit boards by their edges and push them back into the connectors at the bottom of the Manta housing.

3) Examine the MBP's o-rings and the top of the Manta housing. Remove all contaminants, if any, from the o-rings and the sealing area. If you wiped away the existing grease during cleaning, apply a liberal amount of silicone grease to the o-rings and the housing.

4) Notice that the little blue connectors on the top cap (below) mated to the two circuit boards in the Manta. There is one narrow connector and one wide connector to fit the one narrow circuit board and the one wide circuit board. All you have to do is push the MBP into the Manta where the top cap had been, making sure that the two connectors slide onto the two circuit boards. You may have to wiggle the MBP a bit to line up the connectors and the boards as you slide the MBP into the Manta.

5) Line up the screw holes in the Manta housing with the threaded holes in the MBP and use the two Allen screws to fix the MBP in the Manta. You may have to twist the Manta housing to get the screw holes to line up – it's OK, it's made to twist.

6) Examine the o-ring seals to ensure that the two narrow black lines, consistent in width, are present as they were just before you removed the when the top cap.

Starting and Stopping Logging Sequences

When you turn the MBP switch to its "on" position (when the " **I** " symbol is adjacent the indicator screw), the Manta begins logging. The Manta will continue logging until the MBP switch is turned to its "off" position.

When logging is turned on, the Manta will log at the interval you set when talking to the Manta with your PC (i.e., you set the logging interval via the Manta Manager software).

To start a logging sequence:

1) Remove both thumb screws and rotate the switch lever to its "on" position (when the " **I** " symbol is adjacent the indicator screw).

2) Replace both thumb screws and secure.

3) Check to make sure the little green light on the Manta circuit board is blinking – this tells you that the Manta's logging routine has started. Secure the instrument in the water before leaving!

The Large Knob

The On-Off Switch

" 1 " Indicates On

" 0 " Indicates Off

To end a logging sequence:

1) Yes, you're right! To end a logging sequence, you turn the switch knob from its "on" position (when the " **I** " symbol is adjacent the indicator screw) to its "off" position (when the " **0** " symbol is adjacent the indicator screw).

Those with off-brand instruments have also likely been disappointed by logging runs that quit too early – for instance, if a storm event or broken truck has prevented scheduled data dumps. The Manta logger, on the other hand, only stops logging when you rotate the switch from "ON" to "OFF" – again, no programming is required.

Logging Interval, Warm-Up Time, Time Synchronization

Each Manta is factory-set for a logging interval of 30 minutes and a sensor warm-up time of 2 minutes. This means that when logging is active (the switch knob is turned to the "on" symbol: " **I** "), the Manta will turn itself on every 28 minutes, warm up for 2 minutes, log a full set of data, and then turn itself off for 28 minutes. You can change the logging interval and the warm-up time in the PC-based Manta operating software (see the Manta manual).

The Manta is programmed to take data at round-number times convenient for data analysis and database entry. (Really, what good is a data time of 14:39:18? Who remembers where they were at such an odd time?) For instance, suppose your Manta is set for 15-minute intervals and 2-minute warm-ups. If you turn the logger on at 8:05 AM, the Manta will blink the green light to show that it knows it's supposed to be logging. It will then turn itself off only to wake up again at 8:13, and log data at exactly 8:15 (and every 15 minutes thereafter). Had the interval been set to 30 minutes, the Manta would turn itself on at 8:28 and log data at exactly 8:30 (and every 30 minutes thereafter).

Extracting Logged Data from the Manta

You must connect your Manta to a PC to extract data from the Manta. Otherwise the data will just leak out the end of the cable into the air in a form that only dogs can hear. Here's how:

1) Clean all contaminants from the Manta and MBP before dumping data – this helps protect the seals (the o-ring type, not barking type).

2) Remove the on-off lever by loosening the thumbscrew and pulling the lever straight out.

3) Connect the newly exposed Manta connector to the USB port on your PC with the supplied cable. Use the USB adapter that came with your Manta.

4) Connect the download cable to your Manta, and then to the USB port on your PC.

5)   Launch the Manta Manager software by double-clicking on the Eureka icon on your desktop (please see the Manta manual). Data is automatically uploaded and saved onto your PC.

6) When you have finished uploading data, unplug the cable from the MBP; reinstall the data-port knob so that it is held in place by the thumbscrew. Tighten the thumbscrew finger-tight.


Changing the Batteries

Bad news: Batteries don't last forever. Good news: You can buy eight "D" batteries at Sam's or Costco for about $6, and confidently install them in the MBP in about two minutes. All you need are the new batteries and a paper towel. When you change the batteries, please:

1) Use only alkaline "D"-cell batteries.

2) Replace all eight batteries at the same time.

3) Use eight of the same brand of battery.

To change the batteries:

1) Clean all dirt and stuff off the MBP, because you are going to expose sealing surfaces as you change the batteries.

2)   Unscrew The Large Knob from the MBP, thus removing the top cap and exposing the batteries. Pull the top cap completely away from the MBP (below), and clean any contaminants from the top cap and o-rings.
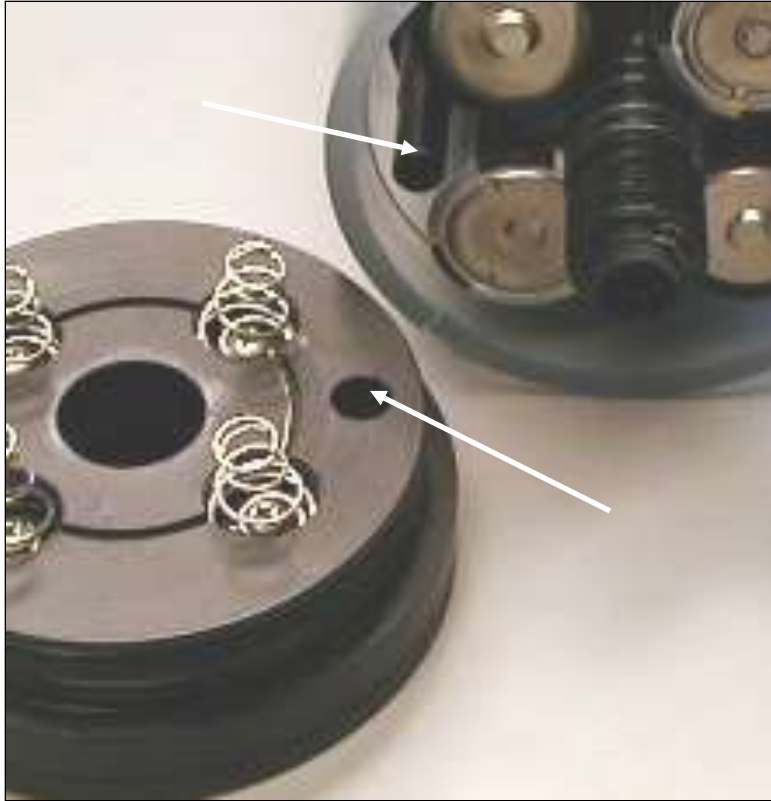
3) Remove the spent batteries, and install the new ones following the polarity label on the MBP.

4) Replace the top cap by screwing the center knob back into the place where you found it. Note that the top cap can only fit one way because the black indexing stud (above) must fit into the hole in the underside of the top cap. Finger-tight is sufficient for the center knob.

Calibration with the MBP Installed

Calibration with the MBP installed is identical to that of a Manta without the MBP, except that the Manta is connected to the PC via the MBP and its cable.

Storage

If your MBP is not going to be used for a few weeks or longer, remove the batteries to prevent their leaking all over the inside of the MBP. Put the MBP, or your Manta and MBP, into a clean plastic bag to protect any exposed seals. Store at room temperature.

The Manta Internal Battery Pack

The Manta with Internal Battery Pack includes 8 C-cell batteries inside a Manta 3 inch housing. Since every Manta has onboard memory, the batteries supply the power need for turning a Manta into a datalogger. There are basically four parts to Manta logging:

- Turning it on or off
- Changing the batteries
- Downloading data
- Changing the logging interval

Turning the Manta Logger ON or OFF

Loosen the stainless steel thumb screw on the top of the Manta. Rotate the on-off switch, and insert the thumb screw in the hole on the left of the picture.

You will notice that the lights will begin flashing on the Manta. It is waking up, looking at the time, and determining when to log a reading.

The Manta ships with a default interval of two minute warm-up and 30 minute interval. Therefore, if you turn it on at 17 minutes past the hour, it will wake up, and determine that it needs to go to sleep until 28 after the hour. It will then wakeup at 28 past, warm-up for two minutes, and log a reading. It will then enter sleep mode for 28 minutes.

Changing the Batteries

Turn the large knob on top of the Manta counter-clockwise until the entire top has worked its way off.

Top Cap

Download Jack

Remove the batteries. They will slide out. Replace batteries as indicated by the + / - indication stickers. It is recommended to use the same brand of batteries. Make sure each column is pointed in the right direction!

Downloading Data

1) Clean all contaminants from the Manta before downloading data – this helps protect the seals and connectors.
2) Remove the data-port knob on top by turning counter-clockwise until the lid is removed.
3) Plug the download cable into the download jack on the Manta and to your USB port on the computer
4) Launch the Manta Manager Software. Data will begin transfer automatically.
5) When complete, you can unplug the Manta.

Calibration

Calibrating is just the same as with any Manta. However, you will want to remove the batteries first – otherwise they will fall out! Use the Download cable and connect it to your PC's USB port. Launch the Manta Manager Software.

Changing the Logging Interval

See the Manta Manager software for a description of changing the logging interval or file-name.

Service and Limited 2-Year Warranty

THIS WARRANTY IS EXPRESSLY MADE BY EUREKA ENVIRONMENTAL ENGINEERING CORPORATION (EUREKA) AND ACCEPTED BY PURCHASER IN LIEU OF ALL OTHER WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WHETHER WRITTEN OR ORAL, EXPRESS OR IMPLIED, OR STATUTORY. EUREKA DOES NOT ASSUME ANY OTHER LIABILITIES IN CONNECTION WITH ANY PRODUCT.

WHAT IS COVERED
This warranty statement applies to the Manta Multiprobe. All new Eureka Mantas are warranted by Eureka against defects in materials and workmanship for two years from date of invoice. Our obligation to repair or to replace products, including dissolved oxygen sensors, does not apply to those that have been consumed through normal use.

WHAT IS NOT COVERED
This warranty does not apply to products or parts thereof which may be used or connected to Eureka equipment but which are not manufactured by Eureka. This warranty specifically excludes batteries of any type and all other items, such as calibration solutions, which carry shelf lives. This warranty does not apply to products or parts thereof which have been altered or repaired outside of a Eureka factory or other authorized service center, or products damaged by improper installation or application, or subjected to misused, abuse, neglect or accident.

WHAT WE WILL DO
During the warranty period, we will repair or, at our option, replace at no charge a product that proves to be defective provided that you return the product, shipping prepaid, to Eureka. Eureka's liability and obligations in connection with any defects in materials and workmanship are expressly limited to repair or replacement, and your sole and exclusive remedy in the event of such defects shall be repair or replacement.
Eureka's obligations under this warranty are conditional upon it receiving prompt written notice of claimed defects within the warranty period and its obligations are expressly limited to repair or replacement as stated above.

WHAT WILL WE NOT DO
Eureka shall not be liable for any contingent, incidental, or consequential damage or expense incurred by you or others due to partial or complete inoperability of its products for any reason whatsoever or due to any inaccurate information generated by its products. Eureka's obligations and your remedies are limited as described above.
Products are sold on the basis of specifications applicable at the time of sale. Eureka shall have no obligation to modify or update products once sold.

WARRANTY AND SERVICE INFORMATION
If you have any questions concerning this warranty, please contact Eureka by telephone, fax, letter, or e-mail, at:

Eureka Environmental Engineering
2113 Wells Branch Parkway Suite 4400
Austin, TX 78728

Telephone: 512-302-4333
Fax: 512-251-6842
e-mail: support@eurekaenvironmental.com

Should you be advised by Eureka to return an item, a returned materials authorization number (RMA Number) will be issued. The RMA number must be shown on the Service Memorandum, the address label of each shipping carton, and any correspondence related to the equipment returned for repair.

Please carefully pack your equipment in its original shipping case (or other protective package) to avoid in-transit damage.

Such damage is not covered by warranty, so we suggest that you insure the shipment. We also recommend that the entire instrument, including the battery pack and charger (when applicable), be returned unless a particular faulty component has been clearly isolated. Send the instrument and a complete Service Memorandum to Eureka, using the address shown on the Service Memorandum.

Whether or not the unit is under warranty, it is your responsibility to pay shipping charges for delivery to Eureka.